All claims were rejected as obviously unpatentable in the sense of 35 USC 103 over a combination of References R, M, G and E.

Claims 1-10, 16, 20, 22, 23-30, 36, 41-49 and 55 were rejected as anticipated in the sense of 35 USC 102e on the basis of Reference I of record.

Various of the claims were rejected as failing to comply with 35 USC 112; the Examiner indicated that the structural formulae of the ester and the precise nature of the metal stabilizer should be incorporated in the claims. Claim 50 was rejected as failing to indicate the term being defined.

All claims stand rejected.

Claims 1, 5-15, 18-22, 25-35, 38-41, 44-54 and 56-58 are in the case and are presented for reconsideration.

REMARKS

By the foregoing amendment, Applicants have modified the claims in order to more particularly point out and distinctly claim their invention and to distinguish more clearly over the references of record. Entry of the amendment and reconsideration of the application in light thereof are respectfully requested.

Applicant's attorney wishes to thank the Examiner for the courtesy of a telephone interview granted on March 1, 1982. At that time the Examiner noted the applicability of the Gough (Reference E) and Brecker (Reference I) references under 35 USC 102. Applicant's attorney agreed that it would be necessary to amend the claims to avoid these references.

The Examiner reiterated the rejection under 35 USC 112 and agreed that definition of the tin-containing stabilizer

in accordance with the language at the bottom page 14 of the specification would overcome this rejection.

The Examiner inquired into the status of Applicant's parent application Serial No. 070,503 and Applicant's attorney indicated that it would be abandoned to obviate the prospective double patenting rejection.

During a discussion of metals other than tin, the Examiner stated that no attempt had been made to support claims to stabilizers other than tin-containing compounds and that claims broadly drawn to metal-containing stabilizers were unsupported by the limited disclosure in the specification.

Finally, Applicant's attorney directed the Examiner's attention to the proposition that Example X, pages 30-32 and Example XIV, pages 37-38 support the proposition that the location of the SH group is significant as regards performance; it was argued that, to the extent the prior art teaches that the location of the SH group is irrelevant, the prior art cannot constitute a teaching of the claimed invention. Applicant's attorney also directed the Examiner's attention to column 6, line 34 et seq. of Brecker and noted that Brecker looked for synergy between an organotin compound and a mercapto carboxylic acid ester and was unable to find it. Applicant's attorney noted that this synergy was precisely that which the Examiner felt was suggested by the prior art and it was urged that this teaching of the prior art pointed directly away from Applicant's claimed invention.

It is respectfully submitted that the foregoing amendment to the claims obviates all of the issues in this case and places this case in condition for allowance. In the event that there remain any issues unresolved, the Examiner

is respectfully requested to telephone Applicant's attorney for resolution thereof.

The amendment to the claims is fully supported by the specification and original claims and neither presents nor includes new matter. The amendment to Claims 1, 21, 22 and 41 is supported in the last paragraph of page 14 and the first three lines of page 15. The definition of the mercapto ester is that of Claims 2, 3 and 4, which have now been cancelled.

Claim 50 has been amended to insert the missing group R^2.

Claim 56 has been rewritten to define the organotin compound in accordance with Claims 18 and 38.

The heading "ABSTRACT OF THE INVENTION" has been changed to "ABSTRACT OF THE DISCLOSURE", obviating that basis of objection.

The Examiner has rejected the claims on the ground of prospective double patenting over applicants' parent application Serial No. 070,503 now on appeal to Board of Appeals. Applicants have abandoned that case in favor of the present application; upon such abandonment, the issue of double patenting was obviated.

The Examiner has rejected the claims as fully met in the sense of 35 USC 102 by Reference E of record. The Reference E patentee discloses a stabilizer system for PVC resins comprising an organotin borate and an organic thiol. By the foregoing amendment, the organotin component has been redefined to exclude the borates contemplated by the Reference E patentee. Specifically, the limitation that any oxygen present in the tin-containing stabilizer is bonded only to one or more of tin, carbon, phosphorus and hydrogen excludes the organotin borates, which are characterized by

oxygen bonded to boron. It is therefore submitted that the rejection under 35 USC 102 on the basis of Reference E is no longer applicable and should be withdrawn.

The Examiner has rejected all claims as obviously unpatentable in the sense of 35 USC 103 over a combination of References R, M, G and E. The essence of the Examiner's position is that the present state-of-the-art, as illustrated by said references, highly anticipates that synergism would be obtained between the -SH containing esters of Reference E and a metal-containing stabilizer, such as is disclosed in References M, G and E. The Examiner states that expected synergy is not proof of unexpected results.

Applicants urge that the Examiner's position is refuted by the data. One reading Reference E is taught that various mercaptans are equivalent in performance when combined with organotin borates for use as PVC stabilizers. Applicants have found, however, that the location of the -SH group is significant as regards performance -- at least in connection with stabilizers that are free of boron. Thus, in Example X, pages 30-32 of the specification, Applicants compare

2-mercaptoethyl stearate	$C_{17}H_{35}COOCH_2CH_2SH$
stearyl mercaptan	$C_{18}H_{37}SH$
stearyl mercaptoacetate	$HSCH_2COOC_{17}H_{35}$

respecting stabilization of polyvinyl chloride. The three mercaptans have virtually the same number of carbon atoms; nevertheless, a substantial difference in performance is observed. Again, in Example XIV, pages 37-38, there are compared the following compounds:

lauryl mercaptan	$C_{12}H_{25}SH$
n-decylmercaptoacetate	$HSCH_2COOC_{10}H_{21}$
2-mercaptoethyl decanoate	$HSCH_2CH_2OOCC_9H_{19}$

Each of these mercaptans has twelve carbon atoms, yet the Whiteness Index and Yellowness Index results show that the three mercaptans are not alike in performance. Further, with the mercapto ester (2-mercaptoethyl decanoate) one can obtain results superior to those obtained with a fourfold higher tin content.

Not only does the data refute the Examiner's position, but it is respectfully submitted that the art rejects the synergy which the Examiner believes is suggested. As evidence of this, the Examiner is directed to Brecker, Reference I of record. At column 6, line 34, Brecker states

> "The synergistic interaction between the antimony mercaptocarboxylic acid or ester or mixed acid ester and mercaptocarboxylic acid ester appears to be unique to these components. A similar synergistic effect is not noted, for example, in combinations of mercaptocarboxylic acid esters with organotin compounds, such as dibutyl tin bis-(isooctyl thioglycolate) and other organotin mercaptocarboxylic acid esters, even when ortho dihydric phenols and alkaline earth metal carboxylates are also included in such compositions." (underlining supplied for emphasis)

The conclusion reached by the Examiner respecting obviousness is clearly and unambiguously refuted by Reference I. Brecker et al teach that the synergistic interaction between a mercaptocarboxylic acid ester and an organotin compound, as proposed by the Examiner, does not take place. Brecker et al is illustrative of the current state-of-the-art and indicates that those knowledgeable in the field looked for synergism between a tin-containing stabilizer and a mercapto ester and could not find it. Clearly, one familiar with the prior art would not expect applicants' claimed invention to work. This being the case,

the Examiner's rejection on the basis of 35 USC 103 is without support and should be withdrawn.

The Examiner's rejection of the claims as being fully met by Reference I under 35 USC 102e has been obviated by the deletion of antimony from the scope of the claims. The Examiner is also directed to column 8, line 62 et seq. where Brecker teaches that the SH group can be located on either the alcohol or the acid portion of the ester. Applicants have previously emphasized the fact that this is not the case and that the location of the SH group is significant as regards performance.

The Examiner has indicated that the broad metal-containing stabilizer recitation of the claims was unsupported by a limited disclosure in the specification and that the specification contained no support for metal-containing stabilizers other than tin compounds. While Applicants have limited the scope of the present application solely to tin compounds, Applicants respectfully disagree with the Examiner's position.

It is noted that Example XI compares the effect of a mixture of calcium stearate and zinc stearate with and without a mercapto ester; it is seen that the composition containing the mercapto ester displays improved initial color and improved color after five minutes of heating. In the same example there is compared the combination of calcium stearate, zinc stearate and epoxidized soya oil with and without the mercapto ester. It is again seen that the results are improved by the presence of the mercapto ester.

Applicants respectfully submit that their invention relates to an improvement in the stabilization of vinyl polymers when metal-containing stabilizers are used. The metal-containing stabilizers are conventional and are well

known in the art. Applicants urge that the specification need describe the invention only in such detail as to enable a person skilled in the most relevant art to make and use it. Applicants respectfully submit that knowledgeable practitioners in the art of stabilizing vinyl polymers would understand what compounds would be useful in the context of the present invention. To further support this position, Applicants have, on page 14 of the specification, incorporated by reference the disclosure of conventional well known heat stabilizers for vinyl chloride polymers contained in Chapter 9 of the Encyclopedia of PVC, edited by L. I. Nass (M. Dekker, New York 1976). Applicants urge that a disclosure in the specification of all the compounds embraced by the claims is not required. It is manifestly impracticable for an applicant who discloses a generic invention to give an example of every species falling within it or even to name every such species. It is sufficient that the disclosure teaches those skilled in the art what the invention is and how to practice it. A disclosure which includes a broad description, specific species and working examples is legally sufficient. Applicants urge that their specification as filed indicates the breadth of the subject matter which they regard as their invention. They further urge that the knowledge of the prior art in conjunction with their specification is enabling particularly where the utility of the present invention depends on metal-containing stabilizers whose use is art-recognized and does not involve an element of unpredictability. Although Applicants have elected to expedite the prosecution of the present application by limiting this case to tin-containing stabilizers, they wish to emphasize their profound disagreement with the Examiner's position.

From the foregoing remarks, it is apparent that Applicants' claims are directed to new and unobvious stabilizing compositions that are neither taught nor suggested by the references of record. Accordingly, it is submitted that Applicants' claims now clearly satisfy the statutory requisites for patentable invention and that this application is in condition for allowance. Reconsideration and allowance are earnestly solicited.

Respectfully submitted,

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Date

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